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Amendment to Workplan to Evaluate Free Product Remedial Strategies

L.E. Carpenter & Company

Wharton, New Jersey
USEPA ID No. NJD002168748

November 2001

RMT

346017

RMT
Integrated
Environmental
Solutions

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November 30, 2001

Mrs. Gwen B. Zervas, P. E.
Case Manager
New Jersey Department of Environmental Protection (NJDEP)
Bureau of Federal Case Management
Division of Responsible Site Remediation
CN028
Trenton, New Jersey 08625-0028

Subject: L.E. Carpenter & Company, Wharton, New Jersey ~ NJD002168748
Response to Comments on and Amendment to *Workplan to Evaluate Free Product Remedial Strategies*, (RMT, November 2001)

Dear Mrs. Zervas:

As a follow-up to your emailed comments dated November 20, 2001 and our conference call of November 20, 2001, we have prepared the following responses that constitute an Amendment to the above-mentioned Workplan.

1. **Comment:** Page 2-1: The text states that soils "suspected of lead contamination" will be stockpiled. How is this to be determined? Similarly soils "potentially contaminated with DEHP and BTEX" will be placed on the bench. Is this to be done by simple visual inspection (i.e. Whether product is visible)? In addition, does this procedure introduce the possibility of spreading contamination to the bench area, or is it presumed that that depth will already be contaminated? Finally, as we discussed, it is recommended that it would be more conservative to place the soils on a plastic liner to ensure that contamination is not inadvertently spread.

   Response: Soils will be visually examined during excavation to determine the potential presence for lead as well as product. Colors indicative of waste identified during the lead investigation conducted earlier in November of this year will be used to determine the potential for elevated levels of lead. Visible free-product and the use of a photo-ionization detector and explosimeter will aid in determining the potential presence of DEHP and BTEX products. Shallow excavated soils will be placed on a layer of plastic on the ground surface. The bench wall(s) created in the excavation will also be covered with plastic to prevent the spread of contamination from saturated soils or free product released. Excavation into the saturated zone will also be minimized.

2. **Comment:** Page 2-2, Task 2: If the test pits are to be backfilled with washed stone, what will happen to the contaminated soils? Will the soils be shipped off-site as IDW, or will they simply be left on site, or backfilled? The disposition of these soils should be addressed in the work plan.

   Response: It is anticipated that less than one cubic yard of washed stone will be placed as a "filter pack" for each fluid recovery well installation. Given the site terrain and the fact that several 5-gallon buckets of soil will be removed from each pit for testing, the insertion of the washed stone will result in a relatively unnoticeable amount of mounding from backfilling of the benched material at each test pit and will eliminate the need for off-site disposal.

3. **Comment:** Page 2-2, Task 2: Product thicknesses in the proposed recovery wells may not be representative of the effect of trenches, which would presumably use horizontal piping. How will the final report of the pilot testing field results handle this issue?

   Response: The primary purpose of the product recovery wells is to provide a mechanism to collect sufficient quantities of free product for testing. The resulting well construction is also intended to determine if a substantial increase in the effective surface area of the well will induce greater free product flow. These observations, as well as those made during trench excavation, will help to determine the efficacy of collector trench installation.

4. **Comment:** Page 2-2, Task 3: The text states that sampling for metals "may be necessary." How will this be determined? As mentioned over the telephone, we believe that the testing for RCRA metals should be a required part of the work plan.

   Response: Soil samples collected from the test pits will be analyzed for RCRA metals. The analytical testing may be performed during the thermal bench testing of the material. If this testing is not included in the bench testing protocol, RMT will arrange for analysis of the samples for RCRA metals prior to bench testing of the material.

5. **Comment:** Page 2-2, Task 3: The text gives very little detail on the bench scale study. Typically, work plans of this sort give more information about the testing apparatus and specific analysis methods. In addition, it should be clear what parameters will be monitored by the Combustible Emissions Monitor (CEB). Will the CEB give constant minimum readings below the appropriate safety and emissions criteria, or will measurements be taken at certain intervals? At what temperature(s) will the bench tests be run? For a number of reasons, the work plan should provide a full description of what is intended and expected, both from a regulatory point of view, and because it is important that all parties agree on these specifics beforehand, in an effort to maximize time and get everyone's buy in on the goals and results.

   Response: Details on the bench scale investigations for Low Temperature Thermal Desorption (LTTD) are presented in Attachments A and B.

6. **Comment:** Page 2-3, Task 3: The text needs to be clearer about what other technologies would be evaluated and how. If this would be the subject of a work plan addendum, it would be sufficient to note this.

   Response: Field excavation observations and follow-up geotechnical testing will lead to an early determination as to the practicability of soil removal. Simultaneous bench-scale testing of low-temperature thermal desorption will determine if excavated soils can be effectively treated on site. If either of those decisions proves negative we will prepare a brief technical memorandum summarizing those findings. Also, if excavation proves to be impracticable RMT will focus evaluations on *in situ* source treatment technologies, such as chemical oxidation, as well as hydraulic containment and product removal technologies. If excavation is viable, but thermal proves ineffective, we will evaluate other ex-situ technologies including soil washing as well as off-site disposal. As illustrated in the matrix of potential technologies in Figure 2 of the *Workplan*, RMT has considered the potential options as well as other technologies needed to support a particular option. The scope of data collection planned is intended to allow for evaluation of additional alternatives as that need arises. The attached project schedule indicates specific milestones as well as overlapping of various evaluation tasks.

7. **Comment:** Page 2-3, Task 4: In a number of places, the text states that "up to 3" samples will be collected. What will determine the number of samples? At a minimum, we recommend that 3 samples be taken.

   Response: RMT generally concurs with the comment. Where the *Workplan* states that "up to three" samples will be obtained, a minimum of three samples will be collected.

8. **Comment:** As we discussed, a project specific Health and Safety Plan must be submitted and in place before field work begins. In addition, as we discussed, the original Health and Safety plan should be updated, if needed, and submitted.

   Response: An updated Health and Safety Plan is included with this response letter as Attachment C.

9. **Comment:** The final version of the work plan should provide a detailed schedule outlining key activities and anticipated completion dates.

   Response: A detailed schedule for this investigation is provided as Attachment D. The Schedule is broken into three major components: (1) the field investigation, evaluation and reporting on excavation and thermal treatment (2) the optional investigation and reporting on alternative technologies, and (3) the preparation of a Remedial Action Plan to implement the selected alternative. Critical to the maintenance of this schedule will be the ability of outside laboratories and investigators to provide timely analytical and bench-scale testing results. In addition, it is possible that unforeseen impediments to evaluation of a particular technology may occur that may make revision of the schedule necessary. RMT will keep NJDEP and EPA informed of any factors that may affect this schedule.

Please let us know as soon as possible whether or not you concur with this addendum. We plan on initiating the field work on December 10, 2001.

Sincerely,

RMT, Inc.

Nicholas Clevett

Nicholas Clevett
Project Manager

Attachments: A – Soil Thermal Treatment Analysis
B – Bench Scale Thermal Desorption Treatability Study Information (Hazen)
C – Project Health and Safety Plan
D – Project Schedule

cc: Stephen Cipot, USEPA
Cristopher Anderson, Polyone
Drew Diefendorf, RMT Ann Arbor
Jim Dexter, RMT Grand Rapids
Holly Herner, RMT Ann Arbor
Rich Kratz, RMT Philadelphia
Central Files

Attachment A
Soil Thermal Treatment Analysis

ATTACHMENT A
L.E. Carpenter
Soil Thermal Treatment Analysis

RMT will undertake a multi-phased test program to determine the effectiveness of low temperature thermal desorption (LTTD) technology. As shown on the attached schedule this evaluation will be broken into phases depending on the results of each phase. RMT intends to use Hazen Laboratories of Golden, Colorado to perform the thermal analyses. At each of the three test pits excavated, RMT will collect a composite sample representative of free-product containing soil. Samples will be containerized in a 5 gallon tab-sealed container which will then be placed in a sealed overpack for shipment to Hazen. Duplicate samples will also be collected in each pit for geotechnical and chemical characterization.

Phase Ia - Physical characterization: Three (3) samples from each of the test pits will be submitted to RMT's geotechnical laboratory for analysis as follows:

- Cohesion Limits
- Sticky Limits
- Shrinkage Limits
- Plastic Limits
- Liquid Limits
- Grain-size distribution

The objective of these analyses is to provide information necessary to evaluate procedures and equipment necessary to excavate and process site soils as well as to identify any physical constraints or modification necessary for the treatment system.

Phase Ib – Chemical Characterization: One (1) composite samples will be obtained specifically for pre-treatment testing of VOCs and SVOC content. Additionally three (3) samples from each pit will be submitted for analysis of eight (8) RCRA metals. These results will be used to evaluate LTTD and, potentially, alternative treatment technologies. Severn Trent Laboratories will perform this analytical work.

Phase II – Evaluation of Desorption Potential: If RMT determines that excavation of soils for ex-situ treatment appears viable, the three (3) soil samples submitted to Hazen Laboratories will be tested for:

- Proximate Analysis - ASTM D5142
- Ultimate Analysis - ASTM D3176
- Higher Heating Value - ASTM D1989 via automatic bomb calorimeter
- Ash Fusion Temperature - ASTM D1857 (oxidizing and reducing)
- Moisture Content - Graimetric@105 C
- Ash Content - ASTM D5142

RMT shall utilize the results of these initial screening tests of representative soil samples to make qualitative judgements as the appropriate material handling, thermal processor type and operating parameters. The proximate analysis shall determine moisture content, volatile matter, and ash, and the calculation of fixed carbon content. The ultimate analysis will provide an elemental analysis of the soil matrix (carbob, nitrogen, oxygen, nitrogen, sulfur, chlorine and ash).

In addition, testing shall be performed to confirm the optimum operating temperature of the thermal process for effective treatment and removal of the contaminants from the soil. The tests shall be conducted using a bench-scale batch furnace/oven. A composite sample mix of soil shall be prepared from the samples taken from the three test pits. One (1) test shall be conducted at each of the following temperatures; 450°F, 600°F and 750°F.

The resulting treated soil (ash) from each batch shall be analyzed for VOC and SVOC content (EPA Methods 8260 and Method 8270). If the testing indicates that the LTTD process will meet the site soil clean-up criteria, then additional testing to evaluate specific design criteria will proceed as follows:

Phase III - LTTD Off-Gas Characterization: One additional thermal treatment run for a sample from each of the three test pits will be performed by Hazen to collect and analyze off-gasses generated. The tests shall be conducted using two bench-scale batch furnaces/ovens in series. The first oven will act as the LTTD and the second oven will be used to oxidize the off-gasses. In a full-scale operation a baghouse would be placed prior to the oxidizer, which will not occur during the bench test. During the bench test, gas samples will be collected from the second oven to determine efficiency of the oxidizer and also to determine design requirements for the baghouse depending upon the particulates in the off-gas (from the second oven). Gas samples will be prepared for analysis of particulate (PM), hydrogen chloride and free chlorine (HCl/Cl_2), mercury (Hg), semi-volatile metals (SVM) and low volatile metals (LVM) emissions. In addition, a continuous emissions monitoring system (CEMS) will be used to monitor carbon monoxide (CO), total hydrocarbon (HC), and oxygen (O_2) in the stack gases.

The objective of these analyses is to determine whether the full-scale system will operate with a baghouse and oxidizer for air pollution control or if an additional control such as a scrubber is necessary.

The following sampling methods will be used during the test:

- A combined USEPA Method 5 and USEPA Method 26A sampling train will be used to sample the stack gas for measurement of PM and HCl/Cl_2.
- A USEPA Method 29 sampling train will be used to sample the stack gas for measurement of mercury, SVM, and LVM.
- A CEMS will be used to monitor the concentrations of CO, HC and oxygen in the stack gas.

Phase IV - Leachable Metals Analysis: A sample of the treated soil collected from each of the three thermal tests conducted in Phase III will be analyzed for leachability of the eight (8) RCRA metals using Method 8260 SPLP analysis.

RMT's objective is to utilize the results of these tests of representative soil samples to make qualitative judgements as to the appropriate material handling, thermal processor type and operating parameters. The results will be used to assess the potential pollutants that would result from the thermal treatment process. Working in conjunction with heat and material balance modeling calculations, criteria pollutant predictions such as particulate, hydrocarbons, metals and acid gases will be estimated. This information will be used to assess the appropriate air pollution control technology. The results from this analysis shall also be used to prepare preliminary specifications for soliciting bids from qualified thermal treatment contractors should the LTTD method be selected as the preferred treatment alternative.

Attachment B
Bench Scale Thermal Desorption Treatability Study Information (Hazen)

THERMAL DESORPTION TREATABILITY STUDIES: REMOVING CHLORINATED ORGANIC COMPOUNDS FROM SOILS

Jerome P. Downey, ***Lawrence D. May***, and Kari D. Moore
Hazen Research, Inc., Golden, Colorado, USA

ABSTRACT: Hazen Research, Inc. has developed a bench-scale apparatus and methodology especially suited to thermal desorption treatability studies of media contaminated with chlorinated and recalcitrant compounds. A batch rotary kiln system is used to mix the media while maintaining it at relatively uniform temperature. Desorption characteristics of organic contaminants such as polychlorinated biphenyls (PCBs), dioxins, furans, petroleum-based organic compounds, and other volatile (VOC) and semivolatile (SVOC) organic compounds have been examined. Data show that most organic compounds can be desorbed from soils and sludges at temperatures ranging from 100 to 650°C and retention times of 5 to 30 minutes. Hazen's experience in performing thermal desorption studies on materials contaminated with chlorinated compounds is discussed. The experimental apparatus and methodology are disclosed, along with a discussion of the relationships between desorption efficiency and the pertinent process parameters.

INTRODUCTION

Technology. Thermal desorption technologies use direct or indirect heat to vaporize and remove organic compounds from soils, sludges, and other solid materials. Whereas incineration is intended to fully combust organic compounds, thermal desorption processes physically separate the contaminants from the media, while minimizing organic decomposition. Air or inert gas is normally used to convey the vaporized organic compounds from the contaminated media, but recycled process gas can also be used. Process gases containing vaporized organic compounds can be treated by a number of secondary treatment processes, including thermal oxidation, condensation, carbon adsorption, or chemical neutralization.

Objective. The main objective of most batch kiln thermal desorption test programs is to assess whether the cleanup criteria can be met; if so, the optimization of the process operating parameters becomes the focus of the test work. Cleanup standards for most sites are determined by the appropriate federal, state, or local regulations, or may even be determined on a site-by-site basis. Therefore, the cleanup goal may not be consistent from one site to the next. As a general guideline, the Universal Treatment Standard (40 CFR sec. 268.48) is often quoted.

Testing. Since 1992, Hazen has performed more than 40 studies on materials contaminated with various volatile and semivolatile organic compounds. These studies were conducted using representative samples of soils, sediments, and sludges

from RCRA and CERCLA sites throughout the U.S. In many cases, the media tested contained more than a single contaminant.

THERMAL DESORPTION TESTING

Media and Contaminants. Soils and sludges are the most common media treated by thermal desorption technology. These often come from areas around historical chemical processing plants, drainage basins downstream of such plants, tailing ponds, and even from river dredgings. Contaminants can include inorganic species, organic species, and radionuclides. The organic compounds are classified as either volatile or semivolatile, depending on the boiling point. Generally, compounds that boil below 205°C are considered volatile while those that boil above 205°C are classified as semivolatile. Boiling points for the contaminants of concern are key information when considering the application of thermal desorption; Table 1 summarizes the boiling point ranges for common types of contaminants. Most troublesome organic compounds are amenable to thermal desorption in the range of 100 to 650°C. Some of the media tested, the contaminants of concern, and their concentrations in the untreated media are summarized in Table 2.

TABLE 1. Typical boiling point ranges for common contaminants.

Contaminant Category	Boiling Point Range, °C
VOCs	<205
SVOCs	>205
2,3,7,8 TCDD	500d
PCBs	275 - 385

TABLE 2. Contaminant concentrations in untreated media.

Media	Contaminant	mg/kg
Soil/sludge	Bis(2-chloroethyl)ether	6.04 - 6.56
Soil/sludge	1,2-Dichlorobenzene	0.38 - 0.42
Soil/sludge	1,2-Bis(2-chloroethoxy)ethane	15.2 - 15.8
Soil	Pentachlorophenol	27.5 - 46.4
Soil	Total dioxins	0.35 - 0.54
Soil	Total furans	0.023 - 0.040
Soil	PCBs, Aroclor 1248	6.3 - 26,300
Soil/humus	PCBs, Aroclor 1248	20,000
Soil/clay	PCBs, Aroclor 1248	800
Sludge	PCBs, Aroclor 1248	280,000 - 340,000
Sediment	PCBs, Aroclor 1248	260

Apparatus. A 4-inch-diameter batch quartz kiln system (Figure 1) is used for bench-scale thermal desorption testing. Operating temperatures up to 1,000°C are attainable by indirectly heating the kiln in an insulated clamshell furnace. Raised

dimples act as lifters to enhance the mixing and tumbling of the sample as the kiln rotates. Typical sample charges range from 300 to 1,000 grams, depending on the material to be tested and the planned operating conditions. Control parameters include temperature, pressure, kiln rotational speed, sweep gas composition, and gas flow rate. Process exhaust gases can be treated using condensers, carbon columns, or a thermal oxidizer. Alternatively, the exhaust gases can pass through an emission sampling train to quantify volatile and semivolatile organics, including PCBs, dioxins, and furans. Additionally, a portion of the exhaust gas can be analyzed for concentrations of O_2, CO_2, CO, SO_2, NO_X, and THC using continuous emissions monitors (CEM).

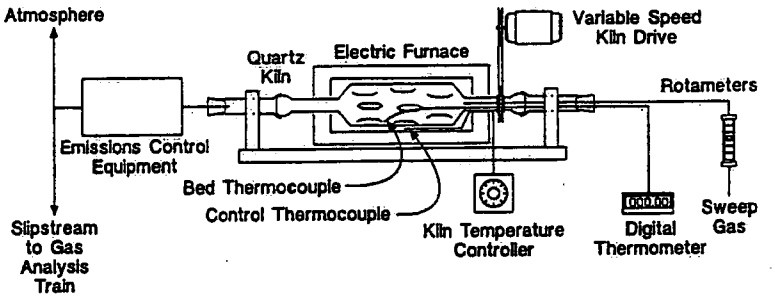

FIGURE 1. Batch rotary kiln system.

Methodology. For a typical thermal desorption test, a known mass of a contaminated soil or sludge is added to the kiln. The kiln is placed in the clamshell furnace and a thermocouple is positioned in the media to measure the temperature. Sweep gas (nitrogen or a blend of nitrogen and air) and the kiln rotation are started. In some tests, the time required for the media in the kiln to reach the designated temperature is defined as the retention time, at which point the heat is turned off and the kiln is removed from the furnace. In other applications, the media are maintained at the designated temperature for a set period of time. During a test, selected data such as temperatures and gas composition are continuously recorded by a data acquisition system. Data not electronically recorded (such as pressures and flow rates) are manually entered onto operational data sheets.

Following a test, the system is disassembled and the products recovered. The mass and/or volume of each product stream is quantified. General physical characteristics of each sample are recorded and chemical and physical analyses may be performed. Representative splits of the test products are packaged and saved for analyses according to the designated protocols for the specific program.

Advantages. The batch kiln system and test methodology offer distinct advantages over other practices. Only a small sample mass is needed to quantify the desorption characteristics of a contaminated soil or sludge. The actual

temperature of the media is measured, providing more accurate information about the process requirements. The rotating kiln provides mixing not available in static applications, improving the potential for physically separating contaminants from the media. In addition, the potential for "clinkers" (agglomerates of material that become very hard on the outside and may not be sufficiently treated on the inside) to develop can be identified. On-line gas analysis can be performed and problems with plugging of the gas handling system can be seen. Finally, the methodology is economical; several tests can be run to assess organic removal as a function of time and temperature at a relatively low cost.

Quality Assurance. Several measures are employed to ensure that the data generated from a desorption test are consistently of high quality. The following protocols are followed:

- Representative portions of contaminated media and test products are analyzed according to recommended protocols (EPA SW-846).
- At least one replicate test is performed per program.
- Routine equipment calibration is conducted, including:
  - Verification of gauge, thermocouple, and flowmeter readings.
  - Confirmation of CEM measurements against certified span gas.
  - Verification of scale accuracy using calibrated weights.
- Equipment is precleaned and triple rinsed.
- Sample blanks are taken when emission sampling is performed.
- Analytical samples are collected and stored in precleaned amber glass jars with Teflon-lined lids, and refrigerated if appropriate.

For all tests, data are recorded both electronically and manually to document and verify the important parameters. In addition, a project journal is maintained to record aspects of a program not covered by routine data collection. All data and results are reviewed by senior members of Hazen's technical staff to ensure accuracy and completeness.

Results. Thermal desorption studies have been conducted with a variety of contaminant types and concentrations in many types of media. Some representative results are summarized in Table 3. Except where noted, retention time is defined as the period of time that the sample was held at the stated temperature.

The first three entries in Table 3 demonstrate the effectiveness of thermal desorption in removing organic compounds with relatively low boiling points, such as bis(2-chloroethyl)ether, 1,2-bis(2-chloroethoxy)ethane, and 1,2-dichlorobenzene. Nearly complete removal of each compound was achieved by processing the samples under relatively mild conditions, i.e., 10 minutes at 230°C.

The next three examples in Table 3 illustrate the effect of temperature on the removal of pentachlorophenol from samples of contaminated soil. Pentachlorophenol proved somewhat more difficult to remove, as relatively high concentrations of the compound remained with the solids after processing for 20 minutes at 340°C. Greater than 99% removal was obtained by processing the

TABLE 3. Summary of typical results for thermal desorption studies.

Number of Tests Summarized	Media	Time, min.	Temp., °C	Contaminant of Interest	Untreated, mg/kg	Treated, mg/kg	% Removal Efficiency
2	Soil/sludge	10	230	Bis(2-chloroethyl)ether	6.04 - 6.56	<0.011	99.81 - >99.99
				1,2-Dichlorobenzene	0.38 - 0.42	<0.043	88.68 - >99.99
				1,2-Bis(2-chloroethoxy)ethane	15.2 - 15.8	<0.014 - 0.036	99.76 - >99.99
3	Soil	10 - 30	340	Pentachlorophenol	27.5 - 46.4	0.99 - 1.39	96.40 - 97.00
3			455			<0.130	99.53 - >99.99
3			595			<0.130	99.53 - >99.99
3	Soil	10 - 30	340	Total dioxins	0.35 - 0.54	0.35	0.00 - 35.19
3			455			0.0007	99.80 - 99.87
3			595			0.0	>99.99
3	Soil	10 - 30	340	Total furans	0.023 - 0.040	0.006	73.91 - 85.00
3			455			0.0	>99.99
3			595			0.0	>99.99
1	Soil	GEC	540 - 595	PCBs, Aroclor 1248	26,300	<1	>99.99
5	Soil				6.3 - 120	<1	>99.99
2	Soil/humus				20,000	<1	>99.99
2	Soil/clay				800	<1	>99.99
2	Sludge				280,000 - 340,000	<1	>99.99
2	Sediment				260	<1	>99.99

Note: GEC - tests were run until gas evolution ceased.

material at 455°C; no measurable improvement was realized by increasing the temperature to 595°C.

The test series conducted with soil samples contaminated with dioxins and furans showed that greater than 99.99% removal of each compound was possible. As expected, the furans were more easily desorbed, and greater than 99.99% removal was achieved when the samples were processed at or above 455°C. For the dioxins, 595°C was required to exceed four nines removal efficiency.

In contrast to the other tests summarized in Table 3, the PCB-bearing media were typically processed at temperature until evidence of gas evolution had virtually ceased. This mode of operation was initially selected because the as-received samples had high initial moisture content and/or high levels of other, more volatile contaminants relative to the PCB concentrations (measured as Aroclor 1248). This methodology has proven exceptionally successful for PCB removal. Regardless of the media type or the initial PCB concentration, every sample that was processed within the temperature range of 540 to 595°C analyzed less than 1 mg/kg PCB.

Conclusions. The removal efficiency of any given contaminant will be affected by the type of matrix (sand, clay, soil, sludge, or sediment). A well-designed test program and experimental matrix are essential to determine the feasibility of applying thermal desorption technology. The batch kiln system and methodology can be used to establish the efficiency at which various organic compounds can be desorbed from a representative sample of media. Also, the requisite solids temperature and retention time can be expediently determined from batch kiln test results. However, it is important to understand the limitations of conducting small-scale tests in batch mode and the risks involved in extrapolating laboratory data to a commercial scale operation. Before implementing any thermal desorption process, it is advisable to conduct confirmatory tests in continuous mode using a larger, pilot scale system.

REFERENCES

Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. 40 CFR sec. 268.48.

U.S. Environmental Protection Agency. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. SW-846.

Attachment C
Project Health and Safety Plan

Hazard Assessment

1. General Information

Project:	LE Carpenter Free product Investigation	**Project Number:**	3868.27
Site Address:	170 North Main Street., Wharton, NJ	**Project Manager:**	Nick Clevett
Prepared By:	Holly Herner	**Date:**	November 28, 2001

Approved By: Nick Clevett (PM) Garret Miller (HSC)

Date: 11/30/01 11/28/01

Proposed Scope of Work and Specific Tasks: Test Pit Installation - Three test pits wil be installed in areas believed to have the greatest thickness of free product, Bis-(2-ethylhexyl) Phthalate (DEHP). An area lined with plastic at each pit will be used for storage of the first four feet of materials removedfrom each pit. A benched area within the trench will be lined with plastic and used to store the deeper soils excavated final depth of eight to ten feet. Three samples will be collected from each pit. Visual obsevations and physical measurements will be made of the soils and liquids in the test pits. Product Recovery Well Installation - Following excavation, one product recovery well will be installed in each test pit. The wells will be packed with wash stone. The ecavations will be backfilled with the excavated soils.

RMT Role On-site:

- ☐ Resident Project Representative (*e.g.*, "Observe and Document")
- ☒ Construction Manager (*e.g.*, Managing Contractor/General Contractor)
- ☒ Representative for Client (*e.g.*, "Agent for Owner")
- ☐ Other (describe)

Proposed Dates of On-site Work: December 10 - 14, 2001

Background Information Review: ☐ Preliminary ☐ Moderate ☒ Substantial

Documentation/Summary Overall Hazard: ☐ Serious ☒ Moderate ☐ Low ☐ Unknown

2. Site Characterization

Facility Description: Site is currently regulated under CERCLA as a Superfund Clean-up. Most buildings, to date, have been demolished. The site undergoes monthly enhanced fluid recovery to extract free-phase product from the surface of the water table, in addition to quarterly groundwater monitoring. Certain areas have received closure from the NJDEP as areas of concern. A lead investigation consisting of multiple test pits was completed in November 2001.

Status: ☐ Active ☒ Inactive ☐ Unknown

Operations (current and past): When active (1943-1987), the site operated as a manufacturing facility for vinyl wall coverings. Portions of the site are currently subleases as warehouse space. The site was operated as an iron mine from the mid-1700s through the late 1800s.

Unusual Features (utilities, terrain, etc.): None.

History (worker or nonworker injury, complaints from public, previous agency action): The site has undergone extensive demolition east of the rail spur. As a result, the site topography has been altered. The site is bounded by the Rockaway River (south), Washington Forge Pond (west), a drainage ditch (east), and Ross Street (north).

3. Site Classification:

Site Type Allocated: ☐ 1 Known or controlled hazards ☐ 2 Known and/or controlled hazards, but with invasive or hazardous activities ☒ 3 Regulated by 29 CFR 1910.120

Comments: Extensive site investigation has identified all contaminants of concern in both the solid and liquid matrix.

4. Hazard Evaluation

Potential Chemical Hazards:

SUBSTANCE NAME (1)	PHYSICAL STATE	KNOWN CONCENTRATION LEVELS PRESENT (2)	POTENTIAL ROUTES OF EXPOSURE	ACGIH TLV	OSHA PEL
Toluene	Liquid	123 ppm	Inh, Abs, Ing, Con	50 ppm	100 ppm
Total Xylenes	Liquid	11 ppm	Inh, Abs, Ing, Con	100 ppm	100 ppm
Ethylbenzene	Liquid	1.88 ppm	Inh, Ing, Con	100 ppm	100 ppm
Lead	Solid	5,404 ppm	Inh, Ing, Con	.05 mg/m^3	0.1 mg/m^3
Bis-(2-ethylhexyl) Phthalate (DEHP)	Liquid Solid	14 ppm 14,000 ppm	Inh, Ing, Con	unknown	Unknown

(1) Attach MSDS if available.
(2) Attach laboratory results or tables if available.

Ionizing Radiation:

Did the "client" use radioactive materials on site, past or present: ☐ Yes (complete table below) ☒ No

Possibility of contamination or exposure due to past or present use of radioactive materials: ☐ Yes (complete table below) ☒ No

SOURCE	QUANTITY	PHYSICAL STATE	POTENTIAL OF EXPOSURE	CONTROL MEASURE

If the answers to the above questions are both No, this table will remain blank.

Will a nuclear moisture/density or XRF gauge be used on site? ☐ Yes (see below) ☒ No

If yes, will it be a RMT gauge? ☐ Yes (see below) ☐ No (see Subcontractor H&S Qualifications/ Performance Form)

If the answer to any questions in this section is "Yes," send a copy of the Hazard Assessment and Health & Safety Plan to the RMT Radiation Safety Officer (RSO).

Physical Safety Hazards On-site and Control Measures

HAZARD	CONTROL MEASURE
Cold stress	Take breaks in a warm area frequently. Provide warm drinks. Dress for the weather (wear layers).
Excavations	Stay away from excavated areas. Maintain eye contact with the operator to ensure safety. Wait for bucket to stop swinging before moving towards it to collect sample.
Hand tools	Take breaks to avoid repetitive motion injuries.
Housekeeping	Dispose of Investigation Derived Waste nightly. Do not leave used gloves or PPE in vehicle.
Lighting	Work during daylight hours only.
Noise	Wear hearing protection as necessary.
Severe weather	Cease work during lightning storms. Seek shelter in vehicle or inside facility building.
Slips/trips/falls	Be aware of surroundings. No running. Watch footing for stumps, sticks etc., that could trip.

Site Health & Safety Plan

1. General Information

Project:	LE Carpenter Free product Investigation	**Project Number:**	3868.27
Site Address:	170 North Main Street., Wharton, NJ	**Project Manager:**	Nick Clevett
Prepared By:	Holly Herner	**Date:**	November 28, 2001

Approved By: Nick Clevett (PM) Garret Miller (HSC)

Date: 11/30/01 11/28/01

TEAM MEMBER	RESPONSIBILITIES
John Mihalich	RMT Site Health and Safety Representative/ Geologist
Drew Diefendorf	Hydrgeologist

2. Training and Medical Surveillance

Training Level Required:

☒ HAZWOPER 40/8 hour, First Aid, CPR (for all Type 3 sites)

☐ Specialty (*e.g.*, confined space, lockout/tagout, Troxler radiation safety)

List:

Medical Surveillance Level Required:

☒ HAZWOPER physical

☐ Special medical tests

List: None

Exceptions/Modifications to training or medical surveillance required: None

3. Personal Protection

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

LOCATION	JOB FUNCTION	LEVEL OF PROTECTION
Test Pit Excavations	Collect samples from backhoe bucket. Measure groundwater levels. Composite samples. Run PID continuously in the breathing zone.	☒ D ☐ C ☐ B ☐ A
Groundwater sampling from Test Pit Wells	Measure groundwater levels, collect groundwater samples.	☒ D ☐ C ☐ B ☐ A
		☐ D ☐ C ☐ B ☐ A
		☐ D ☐ C ☐ B ☐ A

Specific protective equipment for each level is as follows: (1)

Level A

Respiratory:
- ☐ SCBA
- ☐ Air-Line Supplied Air Respirator
- ☐ Other (describe)

Level B

Respiratory:
- ☐ SCBA
- ☐ Air-Line Supplied Air Respirator
- ☐ Other - Level C-D plus the following exceptions/modifications -

Level C

Respiratory - Air-purifying respirator with cartridge/canister type:
- ☒ HEPA, acid gas, organic vapors (*e.g.*, MSA GMC-H)
- ☐ HEPA only
- ☐ Other - Level D plus the following exceptions/modifications -

Level D

Respiratory - None

Other:
- ☒ Safety glasses
- ☒ Hard hat
- ☒ Safety shoes
- ☒ Ear plugs/muffs
- ☐ Snake chaps/Gaiters
- ☒ Protective clothing and/or gloves required (*i.e.*, modified Level D)
- ☐ Other (describe)

Other skin, eyes, and fall protection required:

Gloves:
- ☐ Butyl rubber
- ☐ PVC-coated
- ☐ Neoprene
- ☒ Nitrile
- ☐ Other (describe)

Protective clothing:
- ☒ Tyvek® or equivalent
- ☐ Tyvek® polyethylene-coated or equivalent
- ☐ Tyvek® Saranex® or equivalent
- ☐ Other (describe)

Radiation Safety:
- ☒ Dosimeter Badge
- ☒ Other (describe) Ring Badges

(1) See RMT Health and Safety Manual for minimum criteria.

Criteria for changing protection levels are as follows:

CHANGE:	APPROVALS REQUIRED (1)		
	HSR	HSC	CHSM
To Level C when ambient concentration in the breathing zone exceed 25ppm (using safety factor of 2 for of TLV of 50ppm for Toluene).	☒	☐	☐
To Level when	☐	☐	☐
To Level when	☐	☐	☐
To Level when	☐	☐	☐
Evacuate the area when:			

(1) HSR: On-site Health & Safety Representative
HSC Regional Health & Safety Coordinator
CHSM Corporate Health & Safety Manager

Changes to the level of protection shall be made after the required approvals are obtained. All changes shall be recorded in the field log and reported to the HSC as soon as possible.

4. Air Monitoring

The following monitoring instruments shall be used on-site to measure airborne contaminant concentrations in the breathing zone:

	FREQUENCY OF MONITORING
☐ Combustible Gas Indicator	
☐ O_2 Monitor	
☐ Colorimetric Tubes (type)	
☒ PID	PID will be used during excavation of the test pits as a precaution. Measurements will be taken continuously in the breathing zone. Based on the ionization potentials of the chemical hazards identified a 10.2 eV minimum lamp is required.
☐ FID	
☐ Other (specify)	

5. Site Control (Describe or attach sketch)

Work Zones:

Support Zone: Off Site

Contamination Reduction Zone (area used for decontamination): Test Pit Excavations

Exclusion Zone (area considered contaminated): NA

Site Entry Procedures:

- ☒ Notify Site Health and Safety Representative.
- ☒ Read Health & Safety Plan and sign Acknowledgment Statement
- ☐ Check in with facility security guard.
- ☒ Wear proper personal protective equipment.
- ☐ Attend facility orientation.
- ☒ Conduct "Toolbox" safety meeting.
- ☐ Other (specify):

Decontamination Procedures:

Personnel: Remove tyvek, booties and then gloves in that order. Change gloves between each sampling location.

Equipment: Wash in an alconox solution and then rinse with de-ionized water.

Investigation-derived Material Disposal:

- ☒ ***Leave on site for disposal.***
- ☐ ***Other (describe)***

Work Limitations (time of day, buddy system, etc.): Work during daylight hours only.

Troxler Radiation Safety:

- ☒ Radiation information is not applicable to this project.
- ☐ Notify RSO.
- ☐ Wear dosimeter badge when handling gauge.
- ☐ Post applicable radiation signs.
- ☐ Post emergency numbers.
- ☐ Provide at least two lock systems for overnight storage.
- ☐ Maintain storage at least 15 feet from full-time workstations.
- ☐ Block and brace gauge during "all" transportation.
- ☐ Limit "public" exposure to gauge while in use.
- ☐ Provide sketch of gauge storage to RSO.

Contingency Planning

LOCAL EMERGENCY RESOURCES:	
Ambulance 911	Hospital Emergency Room 911
Police 911	Fire Department 911
USEPA Contact Steven Cipot (Case Manager Region II) (212) 637-4411	Poison Control Center Pennsylvania 800/521-6110
Other Gwen Zervas - NJ Department of Environment (609) 633-7261	

SITE RESOURCES:	
Water Supply Purchase DI water offsite	Radio None
Telephone John Mihalich (215) 275 - 5945 cell	Other

EMERGENCY CONTACTS:	
RMT Technical Contact:	Drew Diefendorf (888) 971-7179
RMT Project Manager (PM):	Nick Clevett (312) 575-0200, Cell (312) 286-4490
RMT Corporate Health & Safety Manager (CHSM):	Shannon Posey 864/234-9431 (work) 864/787-7918 (cell) 864/898-3003 (home)
Radiation Safety Officer (RSO):	John Hanson 608/662-5238 (work) 608/220-2502 (radiation program emergency only) 608/222-4588 (home)
RMT Health & Safety Coordinator (HSC):	RMT Ann Arbor – Garret Miller (734) 971 – 7080; cell 734-355-7161
RMT Field Contact	John Mihalich – (610) 834-0490; (215) 275 – 5945 cell
Site Contact:	Ken Redcliffe (973) 366-9577
Client Contact:	Cris Anderson (440) 930-1334

Emergency Routes (give directions AND attach map):

Hospital: St. Clare's Hospital, 25 Pocono Road, Denville, NJ (973) 625-60001. Start out going North on N MAIN ST towards ROSS ST by turning left (0.1 miles). 2. Turn RIGHT onto E DEWEY AVE (0.5 miles) 3. Turn LEFT onto NJ-15 (0.0 miles). 4. Take the I-80 EAST ramp (0.7 miles) 5. Merge onto I-80 E (4.2 miles) 6. Take the US-46 EAST exit, exit number 38, towards DENVILLE(RT-53) (0.2 miles) 7. Merge onto US-46 (0.4 miles) 8. Turn RIGHT onto W MAIN ST (0.1 miles) 9. Turn LEFT onto DIAMOND SPRING RD (0.3 miles) 10. Turn SLIGHT RIGHT onto POCONO RD (0.6 miles). Emergency Room is on the _____ of the street.

Other:

Emergency Procedures:

If an emergency develops at the site, the discoverer will take the following course of action:

- Notify the proper emergency services (fire, police, ambulance, etc.) for assistance.
- Notify other affected personnel at the site.
- Contact RMT and the client representative to inform them of the incident as soon as possible.
- Prepare a summary report of the incident for RMT and the client representative.

Emergency Equipment Required On-site:

☒	First Aid/Bloodborne Pathogens Kit	☒	Fire Extinguisher
☐	Eye Wash	☐	Spill Control Media
☐	Shower	☐	Other: (describe)
☐	Other: (describe)	☐	Other: (describe)

Acknowledgment Statement:

As an employee of RMT, Inc., I have reviewed the Hazard Assessment and Site Health & Safety Plan. I hereby acknowledge that I have received the required level of training and medical surveillance, that I am knowledgeable about the contents of this site-specific Health & Safety Plan, and that I will use personal protective equipment and follow procedures specified in the Health & Safety Plan.

Signatures of RMT Site Personnel (Required):

_____ **Date:** _____

_____ **Date:** _____

_____ **Date:** _____

_____ **Date:** _____

Health & Safety Plan
Initial Report of Incident

1. Type of Incident

☐ Injury/exposure only ☐ Property loss only ☐ Injury and property loss ☐ Reportable incident without injury or property loss
☐ Ergonomic symptoms

Project Number:	Project Name:	Date of Incident/Exposure:	Time:	☐ AM ☐ PM

Incident/exposure or office location:

Name of RMT employee involved:

Name(s) of witnesses to incident, if any:

If incident caused death or serious injury, this report must be called in to the Health & Safety Director and Human Resources Manager *immediately*!!!

2. Injury/Exposure

Injured employee's full name:	Did injured see a doctor? ☐ Yes ☐ No
Name and address of treating doctor (and hospital, if one was used):	Was employee treated in an emergency room? ☐ Yes ☐ No
Describe affected body part and the type/degree of damage or exposure:	Was employee hospitalized overnight? ☐ Yes ☐ No

If the incident resulted in a fatality, enter date of death _____

3. Incident Description and Analysis

Give detailed description of incident (attach additional pages if necessary):

Provide an explanation if the incident was associated with the following:

Job factors:

Personal factors:

Unsafe conditions:

Unsafe practices:

Other:

4. Ergonomic Symptom Survey

Check Area: ☐ Neck ☐ Shoulder ☐ Elbow/forearm ☐ Hand/wrist ☐ Fingers
☐ Upper back ☐ Low back ☐ Thigh/knee ☐ Lower leg ☐ Ankle/foot

Height:	Weight:	Age:	☐ Male	☐ Female

Glasses: ☐ Yes ☐ No | Contacts: ☐ Yes ☐ No | Hearing Air: ☐ Yes ☐ No | Physical disability ☐ Yes ☐ No

Check all boxes that describe the duties you perform on a regular basis or reflect common conditions at work.

☐ Low light conditions	☐ Awkward reach conditions	☐ Handling heavy objects
☐ High reach distances	☐ Insufficient rest of muscles	☐ Prolonged typing
☐ High or fast pace work	☐ Prolonged bending	☐ Twisting more than 45 degrees
☐ Prolonged stooping	☐ Reaching below knees	☐ Heavy stair usage
☐ Lifting above shoulders	☐ Heavy repetitive lifting	☐ Awkward work height
☐ Prolonged standing	☐ Prolonged sitting	☐ Prolonged computer usage

Check all boxes that best describe your problem:

☐ Aching	☐ Numbness (asleep)	☐ Tingling	☐ Other
☐ Burning	☐ Pain	☐ Weakness	☐ Other
☐ Cramping	☐ Swelling	☐ Other	☐ Other
☐ Loss of color	☐ Stiffness	☐ Other	☐ Other

4. Ergonomic Symptom Survey (continued)

When did you first notice the problem? Month: Year:

How long does each episode last?

How many separate episodes have you had in the last year?

What do you think caused the problem?

Have you had this problem in the last 7 days? ☐ Yes ☐ No

How would you rate this problem: Now – None ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Unbearable

When it was the Worst – None ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Unbearable

Please comment on what you think would improve your symptoms:

5. Property Damage/Loss/Theft

Exactly what was damaged, lost, or stolen?

Was this reported to police? ☐ Yes ☐ No If yes, list departments involved:

Describe amount of damage/lost/theft:

6. Action Items

List actions which could be taken to prevent the occurrence of this incident in the future, or to minimize the effects of future incidents.

7. Signature

Name of person completing this form: Office Location: Date:

Signature of person completing this form:

Send this report to the Health & Safety Coordinator who will provide copies to the Corporate Health & Safety Manager, and Human Resources Manager, as required.

This report does not replace a Worker's Compensation (First Report of Injury) or Insurance Claim form which may need to be completed for Human Resources or Loss Prevention.

Office Use Only
Reportable: ☐ Yes ☐ No

Health & Safety
Initial Report of Incident

Section 1 This report is required to be completed if an incident involves the following:

- A work-related injury, illness, or exposure affecting an RMT employee or other personnel working or visiting the location (Sections 1, 2, 3, and 6).
- The development of signs/symptoms related to musculoskeletal disorders (MSDs) or other possible ergonomic issues (Sections 1, 2, 4, and 7).
- Property theft, loss, or damage through an accident, mechanical failure, weather conditions, etc. (Sections 1, 3, 5, and 6).
- A combination of the above (Sections 1,2, 3, 5, and 6).
- Be sure to list any witnesses and their company affiliation, if known. If there is a death or serious injury, the Health and Safety Director and Human Resources Manager must be notified ***immediately.***

Section 3 Examples: Job factors may include long work hours, improper equipment, failure of safety devices, etc.

- Unsafe conditions may include weather, poor ventilation or lighting, traffic, slippery ground, etc.
- Unsafe practices may include failure to use safety devices, failure to follow company policies or procedures, etc.
- Personal factors may include lack of sleep, prior illness, improper training, etc.

Section 5 Describe the property which was damaged/lost/stolen. Include police report number, if applicable. An insurance claim form is probably required. The office Administrative Supervisor can supply a form and answer questions.

Section 6 Describe any actions you feel may be effective to prevent the recurrence.

Section 7 Print your name followed by your signature, office location, and the date that you completed the form. The completed form goes to your office's Health and Safety Coordinator who will provide copies to appropriate managers as required.

Health & Safety Plan
Investigation of Near Miss Incident

Each incident should be investigated. The object is to prevent recurrence and it is only by thorough investigation (visit scene of incident and talk to witness) that real causes can be determined and corrected.

Name of Person Involved in Near Miss:	Job Title:	Office Location:

Age:	☐ Female ☐ Male	Length of time with RMT:	Date of Near Miss:	Time:	☐ AM ☐ PM

Project Number:	Project Name:	Near Miss Location:

Was employee temporarily working in another department or job at time of Near Miss? ☐ Yes ☐ No	How long has employee worked at job where Near Miss occurred?

How did Near Miss occur? Tell all objects and substances involved in Near Miss. What machine or tool? What operations?

Please indicate which of the following contributed to the Near Miss:

☐Failure to secure	☐Improper instructions	☐Lack of training or skill	☐Poor housekeeping
☐Horseplay	☐Improper maintenance	☐Operating without authority	☐Poor ventilation
☐Improper dress	☐Improper protective equipment	☐Physical or mental defect	☐Unsafe equipment
☐Improper guarding	☐Inoperative safety device	☐Unsafe arrangement or process	☐Unsafe position

Analysis and Review

Give us your honest comments on the following questions. We are not trying to blame anyone. Your opinion may help us to prevent repetition.

What do you consider the real cause of this Near Miss? (Please do not use the word "careless.")

What steps are being taken to prevent similar incidents or recurrences? (Example: Employees are being instructed in correct lifting and to get assistance with heavy loads.)

Name of person completing this form: Office Location: Date:

Signature of person completing this form:

Send this report to the Health & Safety Coordinator who will provide copies to the Corporate Health & Safety Manager, Project Manager, Department Manager, and/or Human Resources Manager, as required.

Health & Safety
Investigation of Near Miss Incident

This report is required to be completed if the potential for an incident occurs. This involves an incident that could have resulted in an accident, but fortunately/luckily was avoided. The following example will be used throughout this form: A ladder, its base resting on a slick surface, is leaning up against the side of building. A worker climbs the ladder to get onto the roof. As the worker is climbing onto the roof from the ladder, the ladder slips out from under the worker. The worker makes it onto the roof as the ladder falls to the ground. The potential for a damaging accident occurred, but fortunately was avoided. This is a near miss.

The following questions should be answered when completing this form:

- How did the Near Miss occur?
- What do you consider the real cause of this Near Miss?
- What steps are being taken to prevent similar incidents or recurrences?

Analysis and Review

- What do you consider the real cause of the Near Miss?

  Using the near miss example described above, the real cause of the near miss is simply that the base of the ladder was placed on a slick surface that allowed it to slide out as the worker made his/her transition from the top of the ladder onto the roof.

- What steps are being taken to prevent similar incidents or recurrences?

  Continuing with the example given above, the worker should have had an assistant holding the ladder as he/she was climbing to the roof. Also, to keep the base of the ladder from slipping, a rubber mat should have been placed under the ladder.

RMT Project/Field Safety Audit Form

Project Name: _____ **Project No.** _____

HSC Name _____ **Office Location** _____ **Date of Audit** _____

QUESTION/ ELEMENT	YES NO NA (1)	COMMENTS	CORRECTIVE ACTION NEEDED	DEADLINE FOR CORRECTION	√ (2)
General					
Were subcontractors qualified for the project by using RMT's subcontractor H&S Qualification form?					
For RMT projects with temporary offices, are OSHA and job-site warning posters posted?					
For RMT projects with temporary offices, are job-site injury records kept?					
Is there an RMT site-specific health and safety plan available on site?					
Are all RMT personnel current on training requirements (*i.e.*, 40-Hour HAZWOPER, 8-Hour Refresher)?					
Is the H&S plan signed by all on-site RMT personnel?					
Are H&S procedures listed in the RMT H&S plan being followed by RMT personnel?					
Does the RMT H&S plan address all obvious hazards at this site?					
Is the RMT H&S plan specific to the Project operations/RMT project responsibilities?					

(1) Enter Y for yes, N for no, or NA for not applicable. If no, comment, action plan to correct, date of completion of corrective action, and person responsible for completing corrective action.
(2) Enter a √ when the corrective action has been completed.

RMT Project/Field Safety Audit Form

Project Name: _____ **Project No.** _____

HSC Name _____ **Office Location** _____ **Date of Audit** _____

QUESTION/ ELEMENT	YES NO NA (1)	COMMENTS	CORRECTIVE ACTION NEEDED	DEADLINE FOR CORRECTION	√ (2)
Is training documentation for RMT employees available on site?					
Are all containers labeled to clearly identify there contents?					
Are all RMT personnel current with medical surveillance protocol?					
Is at least one RMT employee on site currently trained in CPR and First Aid?					
Is appropriate PPE identified on the RMT H&S plan?					
Is the PPE being utilized by RMT personnel as directed in the H&S plan?					
Are subcontractors using appropriate personal protective equipment to protect their employees?					
Are hot work zones established for hazardous waste operation and enforced?					
Are medical facilities identified on the RMT H&S plan?					
Are compressed gas cylinders being used on site? If so, are these cylinders properly secured?					

(1) Enter Y for yes, N for no, or NA for not applicable. If no, comment, action plan to correct, date of completion of corrective action, and person responsible for completing corrective action.
(2) Enter a √ when the corrective action has been completed.

RMT Project/Field Safety Audit Form

Project Name: _____ **Project No.** _____

HSC Name _____ **Office Location** _____ **Date of Audit** _____

QUESTION/ ELEMENT	YES NO NA (1)	COMMENTS	CORRECTIVE ACTION NEEDED	DEADLINE FOR CORRECTION	√ (2)
Are written directions to this medical facility clear?					
Are work areas neat and free of trip/fall hazards?					
Is waste being disposed of properly?					
Are passageways and walkways unobstructed?					
Is there adequate lighting in passageways and work areas?					
For projects with potential hazardous releases or fire hazards, has an evacuation plan been developed?					
Hazard Communication					
Are MSDSs for RMT-supplied materials available?					
Are MSDS for subcontractors - supplied materials available?					
Have employees received hazard communication training?					
Hazardous substances clearly marked?					
Is there an Emergency Response Plan or plan in place in case of a release (*i.e.*, spill kit)?					

(1) Enter Y for yes, N for no, or NA for not applicable. If no, comment, action plan to correct, date of completion of corrective action, and person responsible for completing corrective action.
(2) Enter a √ when the corrective action has been completed.

RMT Project/Field Safety Audit Form

Project Name: _____ **Project No.** _____

HSC Name _____ **Office Location** _____ **Date of Audit** _____

QUESTION/ ELEMENT	YES NO NA (1)	COMMENTS	CORRECTIVE ACTION NEEDED	DEADLINE FOR CORRECTION	√ (2)
Fire Protection/Prevention					
Is fire-fighting equipment available?					
Have RMT personnel been trained in use of fire-fighting equipment?					
Is equipment in proper working condition?					
Are "no smoking" signs posted in appropriate locations?					
Electrical					
Are ground fault circuit interrupters needed and in use?					
Are electrical dangers posted?					
Are terminal/discount/breaker dead front boxes equipped with covers?					
Are covers used?					
Have known underground/overhead utilities been identified and clearly marked?					
Power Tools					
Is good housekeeping practiced where power tools are in use?					
Are power tools and cords in good condition?					

(1) Enter Y for yes, N for no, or NA for not applicable. If no, comment, action plan to correct, date of completion of corrective action, and person responsible for completing corrective action.
(2) Enter a √ when the corrective action has been completed.

RMT Project/Field Safety Audit Form

Project Name: _____ **Project No.** _____

HSC Name _____ **Office Location** _____ **Date of Audit** _____

QUESTION/ ELEMENT	YES NO NA (1)	COMMENTS	CORRECTIVE ACTION NEEDED	DEADLINE FOR CORRECTION	√ (2)
Are power tools properly grounded or double insulated?					
Are mechanical ties and guards in use with power tools?					
Are power tools stored neatly when not in use?					
Are the right tools for the job being used?					
Ladders					
Are ladders inspected and in good condition?					
Are ladders properly secured to prevent slipping, sliding, or falling?					
Do side rails extend 36 inches above the top of the landing?					
Are rungs and cleats over 12 inches on center?					
Are stepladders fully open when in use?					
Are metal ladders being used around electrical equipment?					
Are ladders maintained and properly stored?					
Are ladders painted?					

(1) Enter Y for yes, N for no, or NA for not applicable. If no, comment, action plan to correct, date of completion of corrective action, and person responsible for completing corrective action.
(2) Enter a √ when the corrective action has been completed.

RMT Project/Field Safety Audit Form

Project Name: _____ **Project No.** _____

HSC Name _____ **Office Location** _____ **Date of Audit** _____

QUESTION/ ELEMENT	YES NO NA (1)	COMMENTS	CORRECTIVE ACTION NEEDED	DEADLINE FOR CORRECTION	√ (2)
Scaffolding					
Is there a competent person on sight?					
Are all connections secure?					
Is scaffold tied into structure when it exceeds 4 times the base width of the scaffold?					
Are working areas free of debris, snow, grease, ice?					
Are workers protected from falling objects?					
Is the scaffold plumb and square with crossbracing?					
Are guard rails, intermediate rails, toe-boards, and end rails in place for scaffolds over 10 feet?					
Is scaffold equipment in good working order?					
If scaffold is illegal to climb, is proper notification attached?					
Have employees received training in proper scaffold use?					
Manholes and Confined Space Entry					
Has access and egress been provided?					
Has an entry permit been obtained?					
Have hazards been properly identified?					

(1) Enter Y for yes, N for no, or NA for not applicable. If no, comment, action plan to correct, date of completion of corrective action, and person responsible for completing corrective action.
(2) Enter a √ when the corrective action has been completed.

RMT Project/Field Safety Audit Form

Project Name: _____ **Project No.** _____

HSC Name _____ **Office Location** _____ **Date of Audit** _____

QUESTION/ ELEMENT	YES NO NA (1)	COMMENTS	CORRECTIVE ACTION NEEDED	DEADLINE FOR CORRECTION	√ (2)
Is air monitoring equipment on site, appropriate, calibrated, and in use?					
Are areas being ventilated before entry and during occupation?					
Have attendant and rescue personnel been identified?					
Have entrant, attendant, and rescue personnel been identified?					
Is proper rescue equipment on site? Inspected?					
Is appropriate lighting provided?					
Motor Vehicles					
Have operators received training?					
Brakes, lights, horn, seat belts intact and functioning?					
Are personnel carried in a safe manner?					
Are backup lights or warning signal working?					
Are fire extinguishers carried, if appropriate?					
Excavations/Shoring					
Any excavation entry by RMT staff?					
Is the competent person overseeing the trenching excavation work on site?					

(1) Enter Y for yes, N for no, or NA for not applicable. If no, comment, action plan to correct, date of completion of corrective action, and person responsible for completing corrective action.
(2) Enter a √ when the corrective action has been completed.

RMT Project/Field Safety Audit Form

Project Name: _____ **Project No.** _____

HSC Name _____ **Office Location** _____ **Date of Audit** _____

QUESTION/ ELEMENT	YES NO NA (1)	COMMENTS	CORRECTIVE ACTION NEEDED	DEADLINE FOR CORRECTION	√ (2)
Is shoring appropriate?					
Is access and egress provided for employees working in excavations of 4 feet or greater in depth?					
For excavation in which employees enter, are materials stored within 2 feet of the excavation?					
Is the excavation barricaded?					
If sloping and benching is used as the protective system for employees, have soils been classified					
Are excavations inspected daily?					
Are excavations over 20 feet in depth in which employees enter, designed by APE?					

HSC Signature: _____ PM Signature: _____

(1) Enter Y for yes, N for no, or NA for not applicable. If no, comment, action plan to correct, date of completion of corrective action, and person responsible for completing corrective action.
(2) Enter a √ when the corrective action has been completed.

Attachment D
Project Schedule

ID		Task Name	Duration	Start
1		**Perform Remedial Options Investigation**	100 days	Fri 11/30/01
2		Submit Response to Work Plan to NJDEP/USEPA	1 day	Fri 11/30/01
3		Mobilize to Site	1 day	Mon 12/10/01
4		Test Pit Installation	1 day	Tue 12/11/01
5		Install Free Product Recovery Wells	1 day	Wed 12/12/01
6		Sample Free Product Recovery Wells	3 days	Tue 12/18/01
7		Excavation/Ex-situ Technology not viable	14 days	Thu 12/13/01
8		Viability of Excavatibility Determined	0 days	Fri 01/04/02
9		Prethermal Desorption RCRA Metal Analyses	20 days	Mon 12/17/01
10		Thermal Desorption Evalution	10 days	Mon 01/14/02
11		Thermal Desorption Viability	0 days	Fri 01/25/02
12		Thermal Off Gas Evaluation	10 days	Mon 01/28/02
13		Post Thermal Desorption RCRA Metals Evaluation	10 days	Mon 01/28/02
14		Geotechnical Laboratory Analyses	8 days	Mon 01/07/02
15		Receive Thermal Desorption Results	1 day	Mon 01/28/02
16		Write Feasibility Summary Report (If Viable)	25 days	Mon 01/28/02
17		Write Feasibility Techmemo (ex-situ technology not viable)	5 days	Mon 01/07/02
18		Technical Summary Report for Client Review	9 days	Mon 03/04/02
19		Submit Technical Summary Report for Agency Review	1 day	Fri 03/15/02
20		NJDEP/USEPA Review	10 days	Fri 03/15/02
21		Respond to Agency Comments	10 days	Fri 03/29/02
22		Submit Response to Client	1 day	Thu 04/11/02
23		Client Review of Comment Response	5 days	Fri 04/12/02
24		Revise per Client Comments	2 days	Fri 04/19/02
25		Submit Comment Response to Agency	1 day	Tue 04/23/02
26		**Investigate Alternative Technologies**	78 days	Mon 01/07/02
27		Determine Technology to Investigate	5 days	Mon 01/07/02
28		Bench Scale Testing (by Others)	25 days	Mon 01/14/02
29		Receive Bench Scale Results	1 day	Mon 02/18/02
30		Write Summary Report of Findings & Race	11 days	Tue 02/19/02
31		Client Review of Summary Report	5 days	Wed 03/06/02
32		Incorporate Client Comments	3 days	Wed 03/13/02
33		Submit Report to EPA/DEP	1 day	Mon 03/18/02
34		NJDEP/USEPA Review	10 days	Tue 03/19/02
35		Respond to Agency Comments	10 days	Tue 04/02/02
36		Submit Response to Client	1 day	Mon 04/15/02
37		Client Review of Comments	5 days	Tue 04/16/02
38		Revise per Client Comments	2 days	Tue 04/23/02
39		Submit Comment Response to Agency	1 day	Wed 04/24/02
40		**Remedial Action Work Plan**	86 days	Thu 04/25/02
41		Develop Remedial Action Work Plan	28 days	Thu 04/25/02
42		Client Review of Remedial Action Work Plan	5 days	Mon 06/10/02
43		Make Client Revisions	4 days	Mon 06/17/02
44		Submit to NJDEP/USEPA	1 day	Fri 06/21/02
45		NJDEP/USEPA Review and Comment	10 days	Tue 06/25/02
46		Review and Respond to Comments	10 days	Mon 07/08/02
47		Client Review of Response	6 days	Thu 07/18/02
48		Revise per Client Comments	2 days	Wed 07/24/02
49		Submit Comment Response to Agencies	1 day	Fri 07/26/02
50		Obtain Remedial Action Work Plan Approval	1 day	Tue 07/30/02
51		**Mobilize for Construction of Remedial Action**	1 day	Wed 07/31/02

Project: LE Carpenter
Date: Fri 11/30/01

Task | Split | Progress | Milestone | Summary | Rolled Up Task | Rolled Up Split | Rolled Up Milestone | Rolled Up Progress | External Tasks | Project Summary

4 Test Pit Installation
Qualitative evaluation of soil excavatibility will be determined during test pit excavation. If it is determined at this time that the soil is unexcavatable RMT will forego any analysis related to the utilization of low temperature thermal desorption.

10 Thermal Desorption Evalution
Determination if thermal desorption can meet site soil cleanup criteria.

13 Post Thermal Desorption RCRA Metals Evaluation
SPLP RCRA Metals analysis only.

15 Receive Thermal Desorption Results
Actual date is dependent upon receipt of results from vendor.
Will determine id Thermal Desorption will meet site specific soil clean-up criteria

26 Investigate Alternative Technologies
The investigation of an alternative remedial technology will only occur if it has been determined that:

- The site is not excavatable
- Thermal Desorption cannot be performed.

29 Receive Bench Scale Results
Actual date is dependent upon receipt of results from vendor.